

### Abstract

A method for transmitting signals through a metal tubular includes the steps of transmitting modulated electromagnetic signals through a non magnetic metal section of the metal tubular, detecting the signals or a field associated with the signals, and controlling or monitoring devices or operations associated with the metal tubular responsive to the signals. A material, geometry, treatment, and alloying of the non magnetic metal section are selected to optimize signal transmission therethrough. A system for performing the method includes the metal tubular and the non magnetic metal section. The system can also include a transmitter device configured to move through the metal tubular emitting the electromagnetic signals, an antenna on the outside of the non magnetic metal section configured to detect the electromagnetic signals, and a receiver-control circuit configured to generate control signals responsive to the electromagnetic signals.